

## BIBLIOGRAPHY

C. FITZHUGH TALMAN, in charge of Library

## RECENT ADDITIONS

The following have been selected from among the titles of books recently received as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies:

*Alessandri, Camillo.*

Geofisica; meteorologia, aerologia e pireliometria. Bologna. [1931.] xix, 565 p. diagrs. 31½ c. (Spedizione italiana di Filippi nell' Himalaia, Caracorum e Turchestan cinese (1913-1914). [Relazioni scientifiche]. Ser. I. Geodesia e geofisica. vol. 3.)

*Bigelow, Henry Bryant.*

Oceanography; its scope, problems, and economic importance. Boston. 1931. 262 p. 21 cm.

*Clyde, George D.*

Snow-melting characteristics. Logan. n. d. 48 p. illus. 23 cm. (Utah agric. exp. sta. Bull. 231 (Tech.). Aug., 1931.)

*Gavilan, Alfonso Reyes.*

Compendio sobre los ciclones tropicales . . . Habana. 1930. 30 p. 19½ cm.

*Heyde, Gustav.*

Recording balloon theodolite. p. 36-37. illus. 27½ cm. (Instrument world. v. 4, June, 1931.)

*Italy. Ufficio presagi.*

I principali tipi isobarici interessanti l'Italia (quinquennio 1926-1930). Roma. 1931. 11 p. plates (fold.) 23 cm.

*Jaumotte, J.*

Sur l'anémomètre de Robinson. 4 p. fig. 27½ cm. (Cong. nat. des sci.)

*Koch, J. P., & Wegener, A.*

Wissenschaftliche Ergebnisse der dänischen Expedition nach Dronning Louises-Land und quer über das Inlandeis von Nordgrönland 1912-13 unter Leitung von Hauptmann J. P. Koch. København. 1930. Abt. 1-2. illus. plates (fold.) 28½ cm. (Meddelelser om Grönland. Bd. 75. 1-2 Afd.)

*Lewis, W. W., & Foust, C. M.*

Direct strokes to transmission lines. p. 452-458. illus. 30½ cm. (Gen. elec. rev., v. 34, no. 8. Aug., 1931.)

*Lugeon, Jean.*

Rapport général sur la question des relations entre les précipitations atmosphériques, le débit et l'évaporation. 13 p. 23½ cm. (Compte rendu des trav. III-ème confér. hydrol. des États balt. tenue à Warszawa en mai 1930. Warszawa. 1931.)

Réflexions sur les méthodes d'investigation en hydro-météorologie. Warszawa. 1930. 15 p. fig. 23½ cm. (III-ème confér. hydrol. des États balt. Warszawa. mai 1930.)

Remarques sur la participation de la Pologne à l'année polaire 1932/33. Warszawa. 1931. 4 p. 24 cm. (Bull. soc. géophys. de Varsovie. Pub. trimest. 1931. I. fasc.) [Author, title, and text in Polish and French.]

*Lundegårdh, Henrik Gunnar.*

Environment and plant development being "Klima und Boden in ihrer Wirkung auf das Pflanzenleben" trans. & ed. from the 2nd German edition, by Eric Ashby . . . London. 1931. xii, 330 p. illus. (incl. maps). pl. diagrs. 23½ cm.

*McAdie, Alexander.*

Airgraphics. Cambridge. 1931. 37 p. diagr. front. 30 cm.

*Mares, David J.*

Know your own weather; popular studies in Australian meteorology. Sydney. 1930. 7,138 p. front. illus. maps. diagrs. 19 cm. Bibliography: p. [131].

*Negretti & Zambra.*

Standard meteorological instruments. [Bolton. 1931.] 140 p. illus. 25½ cm. (List M. 2.)

*Ray, C. L.*

Tipos frecuentes de las condiciones del tiempo en San Juan de Puerto Rico. p. 185-189. 30 cm. (Rev. de obras pub. de Puerto Rico. Año 8, no. 8, Ago. 1931.)

*Schmitt, Wilhelm.*

Föhnerscheinungen und Föhnegebiete. Innsbruck. 1930. 64 p. figs. plates (part fold.) 28 cm. (Wissenschaftl. Veröffentl. des D. u. Oe. Alpenvereins. 8.)

*Smith, Edward H.*

Arctic ice, with especial reference to its distribution to the North Atlantic ocean. Washington, 1931. x, 221 p. illus. 23½ cm. (U. S. Coast guard. Bull. no. 19. Marion exped. to Davis Strait and Baffin Bay under the direction of the U. S. Coast Guard. 1928. Sci. results. pt. 3.)

## SOLAR OBSERVATIONS

SOLAR RADIATION MEASUREMENTS DURING SEPTEMBER  
1931

By HERBERT H. KIMBALL, Solar Radiation Investigations

For a description of instruments employed and their exposures, the reader is referred to the January, 1931, REVIEW, page 41.

Table 1 shows that solar radiation intensities averaged below the normal values for September at all three stations at which measurements of direct solar radiation at normal incidence are made.

Table 2 shows an excess in the total solar radiation received on a horizontal surface at New York, Pittsburgh, La Jolla, Fresno, Lincoln, and Chicago, close to the September average at Madison and Gainesville, and a deficiency at Washington and Twin Falls.

Skylight polarization measurements made on 5 days at Washington gave 56 for the mean percentage of polarization with a maximum of 64 on the 9th. At Madison, polarization measurements made on 11 days gave a mean of 61 per cent with a maximum of 71 per cent on the 11th. These are close to the corresponding averages for each station in September.

TABLE 1.—*Solar radiation intensities during September, 1931*

[Gram-calories per minute per square centimeter of normal surface]

Washington, D. C.

Date	Sun's zenith distance										Local mean solar time	
	Air mass											
	A. M.					P. M.						
e.	5.0	4.0	3.0	2.0	1.0	2.0	3.0	4.0	5.0	e.		
mm.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	mm.		
Sept. 1	15.11	0.58	0.71								16.74	
	12.68	0.58	0.71	0.93	1.29						9.16	
Sept. 8	8.81	0.67	0.77	0.91	1.04	1.36					6.76	
Sept. 9	11.81	0.65	0.78	0.92	1.02	1.19					12.68	
Sept. 10	17.37		0.49	0.66	1.07	0.98	0.73	0.61			17.37	
Sept. 11	18.56		0.46	0.77	0.98						19.89	
Sept. 12	19.23		0.55	0.78	1.05						17.37	
Sept. 14	16.20		0.71	0.79	0.98	1.31					17.96	
Sept. 18	19.89				1.48						10.97	
Sept. 19	10.21	0.63	0.77	0.97	1.24						10.59	
Sept. 22	21.28		0.86	1.02	1.17						22.00	
Sept. 25	6.27		1.13	1.26							7.57	
Sept. 29	5.79	0.86	0.99	1.13	1.30	1.47	1.22				5.36	
Sept. 30	8.48	0.61	0.73	0.90	1.08		1.05	0.81	0.71	0.56	8.18	
Means		0.70	0.72	0.79	0.98	1.24	1.08	(0.77)	(0.66)	(0.56)		
Departures		+0.01	-0.03	-0.07	-0.06	-0.07	+0.03	-0.07	-0.06	-0.10		

<sup>1</sup> Extrapolated.

TABLE 1.—Solar radiation intensities during September, 1931—Con.  
Madison, Wis.

Date	Sun's zenith distance										
	8 a.m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	Noon
	75th mer. time	Air mass									Local mean solar time
e.	A. M.					P. M.					e.
	5.0	4.0	3.0	2.0	1.0	2.0	3.0	4.0	5.0	6.	
Sept. 3	mm.	cat.	cat.	cat.	cat.	cat.	cat.	cat.	cat.	mm.	11.38
Sept. 4	9.14					1.25					9.83
Sept. 5	12.24				1.23	1.43	1.23				13.61
Sept. 10	14.60		0.84	1.03	1.34	1.06					14.60
Sept. 11	15.65	0.74	0.88	1.06	1.22	0.97					13.13
Sept. 12	16.20	0.53	0.68	0.80	1.26						17.96
Sept. 14	16.20			0.70	0.86		1.09				18.59
Sept. 16	16.79					1.32	1.11				11.38
Sept. 17	14.80						1.22				14.10
Sept. 22	14.60				1.10	1.16	1.30				6.76
Sept. 24	6.50						1.28	1.18			7.29
Sept. 28	7.29						1.51	1.14	1.03		
Sept. 29	7.04		0.69	0.88	1.11	1.40					
Means		0.76	0.86	1.06	1.33		1.12	(1.03)			
Departures		-0.14	-0.15	-0.09	-0.04	-0.03	-0.09	-0.09	+0.02		

## Lincoln, Nebr.

Sept. 3	11.81		0.68	0.81	0.99	1.31	0.98	0.77	0.61	0.42	14.10
Sept. 4	13.13		0.73	0.88	1.09	1.31	1.01	0.84	0.70	0.61	11.38
Sept. 5	14.10		0.73	0.88	1.09	1.31					16.20
Sept. 10	12.68		0.90	1.10	1.30						12.68
Sept. 11	14.35		0.75	0.89	1.09	1.38	1.07	0.92	0.79	0.66	13.61
Sept. 12	13.13		0.75	0.88	1.07	1.31	0.92	0.69			13.61
Sept. 16	11.81		0.88	1.01	1.15						15.65
Sept. 18	11.38					1.02					15.11
Sept. 22	8.81	0.84	0.96	1.10	1.27	1.43					10.59
Sept. 25	8.18		1.16	1.31	1.48						8.81
Sept. 26	7.04	1.01	1.20	1.34	1.52	1.31	1.16	1.01	0.92	0.81	8.18
Sept. 29	7.87	0.73	0.82	0.94	1.13	1.39					7.74
Means		(0.78)	0.82	0.98	1.15	1.37	1.05	0.88	0.78	0.65	
Departures		+0.02	-0.04	-0.02	-0.03	-0.09	-0.09	-0.05	-0.08		

TABLE 2.—Total solar radiation (direct + diffuse) received on a horizontal surface  
[Gram-calories per square centimeter]

Week beginning	AVERAGE DAILY TOTALS											
	Washington	Madison	Lincoln	Chicago	New York	Twin Falls	Pittsburgh	Gainesville	Fresno	La Jolla	Miami	New Orleans
Sept. 3	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.
Sept. 10	400	453	507	350	399	422	401	423	515	335	441	433
Sept. 17	356	355	404	1289	357	413	356	386	510	374	512	326
Sept. 24	310	249	326	316	306	321	363	502	506	367	488	312
Accumulated departures on Sept. 30, 1931	323	295	453	322	350	373	279	426	450	336	381	373

## DEPARTURES FROM WEEKLY NORMALS

Sept. 3	+21	+81	+85	+36	+85	-98	+55	+13	-7	-14	
Sept. 10	-18	+9	-2	-6	+53	-79	+2	-31	+14	+55	
Sept. 17	-42	-90	-53	+39	+18	-140	+28	+53	+49	+43	
Sept. 24	-22	+4	+101	+82	+82	-57	-16	-22	+21	-14	
Accumulated departures on Sept. 30, 1931	-471	+3,143	+1,652	+217	+476	-5,788	-1,611		+330	-6,503	

<sup>1</sup> Mean for 4 days. <sup>2</sup> Mean for 6 days. <sup>3</sup> Mean for 5 days. <sup>4</sup> Mean for 4 days.

## POSITIONS AND AREAS OF SUN SPOTS

[Communicated by Capt. J. F. Hellweg, Superintendent United States Naval Observatory. Data furnished by Naval Observatory, in cooperation with Harvard, Yerkes, Perkins, and Mount Wilson observatories. The differences of longitude are measured from central meridian, positive west. The north latitudes are plus. Areas are corrected for foreshortening and are expressed in millionths of sun's visible hemisphere. The total area, including spots and groups, is given for each day in the last column.]

Date	Eastern standard civil time	Heliographic			Area		Total area for each day
		Diff. long.	Longitude	Latitude	Spot	Group	
1931	h m	°	°	°			
Sept 1 (Naval Observatory)	10 47	-41.0	345.5	+4.0	12	108	151
		-12.5	14.0	+12.0	31		
		-1.5	25.0	+2.0			

## Positions and areas of sun spots—Continued

Date	Eastern standard civil time	Heliographic			Area		Total area for each day
		Diff. long.	Longitude	Latitude	Spot	Group	
1931	h m	°	°	°			
Sept. 2 (Naval Observatory).....	10 43	-70.0	303.4	-6.0	3		
		+2.0	15.4	+11.5		93	127
Sept. 3 (Perkins Observatory).....	10 22	+18.5	24.4	+2.0	31		186
Sept. 4 (Naval Observatory).....	10 45	+26.0	20.4	+1.5	93		
		+21.0	7.9	+11.0		25	
Sept. 5 (Naval Observatory).....	10 43	+31.5	18.4	+10.0	31		96
		+39.0	25.0	+2.0			
Sept. 6 (Naval Observatory).....	10 41	+46.0	19.7	+11.5	15		
Sept. 7 (Naval Observatory).....	10 41	+1.5	308.8	-5.5	9		9
Sept. 8 (Naval Observatory).....	10 42	+16.0	310.1	-6.0	6		
Sept. 9 (Naval Observatory).....	10 43	-70.5	210.4	-20.0			
		-42.5	238.4	-9.5	31		
Sept. 10 (Naval Observatory).....	10 42	+28.3	239.4	-9.7	19		62
Sept. 11 (Naval Observatory).....	10 42	+13.2	241.3	-9.2	12		96
Sept. 12 (Naval Observatory).....	10 36	-3.0	238.4	+9.5	37		166
Sept. 13 (Naval Observatory).....	10 36	-69.5	168.7	+3.0	154		191
Sept. 14 (Naval Observatory).....	10 37	-56.0	159.0	+4.0	6		68
		+24.8	239.8	+9.4	74		
Sept. 15 (Naval Observatory).....	13 36	+55.0	270.0	+17.0	12		123
		-40.3	159.8	+3.3	31		
Sept. 16 (Naval Observatory).....	12 13	+39.0	239.1	+9.0	87		118
		-73.0	114.7	+9.0	154		
Sept. 17 (Naval Observatory).....	12 27	-26.5	161.2	+3.3	25		308
		+51.0	238.7	+9.2			
Sept. 18 (Naval Observatory).....	10 49	-57.8	116.5	+8.6	93		
		-12.2	162.1	+3.0	12		
		+8.7	183.0	+19.9	15		
Sept. 19 (Naval Observatory).....	10 42	-63.6	237.9	+8.2	74		194
		+45.0	117.0	+8.0	77		
Sept. 20 (Mount Wilson).....	18 30	-75.0	237.0	+7.0	6		83
		-31.0	117.9	+8.0	68		68
Sept. 21 (Naval Observatory).....	10 37	-36.0	95.4	+9.5	4		112
Sept. 22 (Naval Observatory).....	10 34	-14.0	95.4	+8.0	50		50
		+9.0	118.4	+7.8	56		149
Sept. 23 (Naval Observatory).....	10 16	0.0	96.3	+6.0	62		
		+22.0	118.3	+7.0	31		
Sept. 24 (Naval Observatory).....	10 40	+11.5	94.4	+5.5			106
		+38.0	120.9	+7.5	10		
Sept. 25 (Naval Observatory).....	10 40	+50.5	120.2	+7.5	9		9
Sept. 27 (Naval Observatory).....	10 35	-85.0	318.4	+8.7	62		
		-28.5	16.9	+4.5	12		
		-10.0	33.4	+6.5	15		89
Sept. 28 (Naval Observatory).....	11 22	-75.0	314.7	+8.5			123
Sept. 29 (Naval Observatory).....	10 44	-59.0	317.9	+18.5	123		123
		-68.5	308.4	+18.5	46		169
Sept. 30 (Naval Observatory).....	10 44	-53.5	310.2	+18.5	103		
		-45.0	318.7	+18.7	37		145
Mean daily area for September.....							107

## PROVISIONAL SUN-SPOT RELATIVE NUMBERS FOR SEPTEMBER, 1931

(Dependent alone on observations at Zurich and its station at Arosa)

[Data furnished through the courtesy of Prof. W. Brunner, University of Zurich Switzerland]

September, 1931	Relative numbers	September, 1931	Relative numbers	September, 1931	Relative numbers
1.....	33	11.....	29	21.....	a 10
2.....	a 27	12.....	Mc 23	22.....	Mc 22
3.....	27	13.....			